

REMARKS

This application is amended in a manner to place it condition for allowance.

**Status of the Claims**

Claims 1, 3 and 30 are amended. Support for the amendment to the claims may be found, for example, at paragraphs 0070, 0075, 0107 and 0137 and Figures 1 and 6 of the published application.

Claims 1-14, 17 and 30-32 remain in this application.

**Claim Objections**

Claim 1 was objected to for reciting "provide" in line 8 instead of "provided". The claim has been amended, and withdrawal of the rejection is respectfully requested.

**Claim Rejections-35 USC §112, 1<sup>st</sup> Paragraph**

Claims 1-14, 17 and 30-32 were rejected under 35 U.S.C. §112, first paragraph, for not complying with the written description requirement. This rejection is respectfully traversed.

The follow recitations were objected to by the Official Action:

- Claim 1: "cells accumulated to form two or more

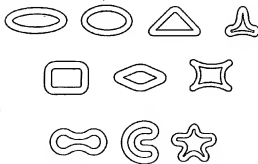
layers in any radial direction". Contrary to the position of the Official Action, paragraph 0091 of the published application discloses "radial direction" not "radical direction". Thus, claim 1 complies with the written description requirement.

- Claim 3: "flat form such that the form has a contact angle of 70 degrees or less". Claim 3 has been amended to clarify this recitation in a manner consistent with paragraph 0075, as mentioned in the Official Action.

- Claim 17: "hollow portions of the hollow fiber membranes of the cell-filled device provide a communication path from the inlet to the outlet for the liquid to be treated." This is supported by paragraph 0098 in light of Figures 12 and 13.

- Claims 30, 31, and 32: referring to various shapes not explicitly described in the specification. However, the original drawings include a variety of shapes, i.e.,

Figure 1:



Although the specification does not explicitly name each of these shapes, the specification refers to some shapes in more general terms. For example, paragraph 0070 describes a

triangle form, but in the top row of Figure 1, there are two "triangle forms", one of which has concave sides, e.g. as recited in claim 31. Similarly, the "rectangular form" on the right side of the middle row has concave sides, as recited in claim 32. Thus, it is believed that claims 30-32 are described in view of paragraph 0070 and Figure 1.

Therefore, withdrawal of the written description requirement is requested.

**Claim Rejections-35 USC §112, 2<sup>nd</sup> Paragraph**

Claims 1-14, 17 and 30-32 were rejected under 35 U.S.C. §112, second paragraph, for being indefinite. This rejection is respectfully traversed.

Claim 1 was rejected for the recitations of "a deformed perfect circle" and "cells accumulated to form two or more layers in any radical direction". However, claim 1 is amended in a manner to clarify both "modified" and "deformed" terms. As to the "radical direction", this was not recited in the claim, and the expression "radial direction" is believed to be definite. Moreover, as the cells are subjected to centrifugal force, the cells move from the center of hollow fiber to wall. See, e.g., Figure 10.

Claims 3 and 6 were rejected for reciting a contact angle. Claim 3 is amended to clarify this feature, and these claims are now believed to be definite.

Claim 3 was also rejected for reciting a "flat" form. Although Applicants believe that this form would have been sufficiently clear to one of ordinary skill in the art in view of the figures, the claim is amended to clarify the meaning.

Claim 30 was rejected for reciting "diamond", but the claim has been amended to clarify this term.

Therefore, the claims are believed to be definite and withdrawal of the rejection is respectfully requested.

**Claim Rejections-35 USC §103**

Claim 1-14, 17 and 30-32 were rejected under 35 U.S.C. §103(a) as being unpatentable over FUNATSU et al. U.S. 6,284,451 (FUNATSU) in view of GORSUCH et al. U.S. 6,802,820 (GORSUCH). This rejection is respectfully traversed for the reasons below.

The Official Action stated on page 6, line 6 that "[t]here is no requirement in Funatsu et al to use hollow fiber having a cross-section that is a perfect circle." In other words, the position of the Official Action was that FUNATSU includes a hollow fiber other than a perfect circle.

However, Applicants respectfully submit that the shape suggested by FUNATSU does not go beyond a "perfect circle". That is, the hollow fiber of FUNATSU that has a shape other than a perfect circle is an accidentally produced hollow fiber, i.e., one obtained through an error during the spinning process.

GORSUCH fails to remedy this deficiency of FUNATSU for reference purposes, as GORSUCH teaches tubular hollow fiber membranes with circular cross sections, as recognized in the Official Action. Indeed, GORSUCH further suggests a preference for tubular hollow fiber membranes with circular cross sections, and would, thus, further discourage one of ordinary skill in the art to utilize a deformed perfect-circle hollow fiber membrane, especially one formed in error as disclosed by FUNATSU.

The hollow fiber of the claimed invention, on the other hand, is purposefully obtained through a flat plate pressing process or a roll pressing process, and the resulting deformed cross-section is different from that of FUNATSU. FUNATSU neither discloses nor suggests a hollow fiber which is purposefully flat plate pressed or roller pressed.

Moreover, with the claimed invention an improvement of culturing status is achieved by regulating the distance from an arbitrary point of the cross section to the nearest inner wall of the hollow fiber to be less than 75 $\mu$ m. And, as can be understood from the present specification, the distance of less than 75 $\mu$ m was obtained by flat plate pressing or roller pressing the hollow fiber, e.g., as recited in claim 1.

Considering that the improvement of culturing status is an advantageous effect of the claimed invention, the present claims are believed to be unobvious over the combination of documents.

Therefore, withdrawal of the rejection is respectfully requested.

**Conclusion**

In view of the amendment to the claims and the foregoing remarks, this application is in condition for allowance at the time of the next Official Action. Allowance and passage to issue on that basis is respectfully requested.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future submissions, to charge any deficiency or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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